Physics Project

Time Limit: 2.0s **Memory Limit:** 256M

Burak and Gizem are working on their physics project. They are given n 2-dimensional vectors that represent forces and they are required to find the maximum equivalent force possible using a subset of these forces.

Can you help them to find a subset of these vectors so that their sum is the greatest possible?

Input

The first line contains a single integer n. The next n lines contain 2 integers each x_i and y_i, the coordinates of the i^{th} vector.

- $1 \leq n \leq 2 \cdot 10^5$,
- $-10^9 \leq x_i, y_i \leq 10^9$.

Output

Print one integer, the squared length of the longest possible vector Burak and Gizem can create.

Example

Input:

```
4
1 0
0 1
1 1
-1 -1
```

Output:

```
8
```

Input:

```
7
1000000000 1000000000
1000000000 1000000000
1000000000 1000000000
1000000000 1000000000
1000000000 1000000000
1000000000 1000000000
1000000000 1000000000
```

Output:

```
9800000000000000000
```

Explanation

In the first sample, summing up the first three vectors gives vector $2\ \ 2$ which squared length is 8.